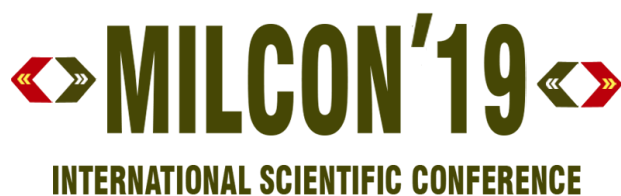


Proceedings of Papers

2-nd International Scientific Conference MILCON'19, Skopje



November 12th, 2019

MILCON 2019 International Scientific Conference is supported by:



This conference is organized under scientific auspices of the following institutions:



The Conference is organized by the Military Academy "General Mihailo Apostolski"- Skopje associated member of the University "Goce Delcev" - Shtip, within the RADLI Project (Regional Advance Distributive Learning Initiative), supported by the Kingdom of Norway and implemented by the Jefferson Institute, USA.

The Conference has been immensely supported by the Ministry of Defence and the Armed Forces of the Republic of North Macedonia

Preface



Respected readers,

In front of you is the thematic Proceedings, as a collection of papers presented at the 2nd MILCON'19 Conference "Contemporary education based on ADL", organized on November 12th 2019, by the Military Academy "General Mihailo Apostolski" - Skopje associated member of the University "Goce Delcev" - Shtip, within the RADLI Project (Regional Advance Distributive Learning Initiative), supported by the Kingdom of Norway and implemented by the Jefferson Institute, USA.

The objective of the Conference was to gather educators and trainers from different countries in order to give us the opportunity to increase both knowledge and cooperation within all aspects of advance distributed learning - ADL. Hence, the Proceedings contain **32** papers focused on the contemporary trends in the use of information technology in a pedagogical way, as well as the best practices both from a theoretical point of view, but also from a practical aspect on the topics related to educational programs using blended learning, emerging learning technologies, multiplatform delivery of courseware, motivational and pedagogical learning strategies and other topics related to ADL. This international scientific conference gives us a wonderful opportunity for exchanging experience and knowledge between the scientific workers and the practitioners from North Macedonia, USA, Serbia, Poland, Slovenia, Bosna and Hercegovina and Norway.

The papers published in the Proceedings are written by eminent scholars as well as by members of the security system participating in the educational process of the army, police and other security services from different countries.

Each paper has been reviewed by international experts competent for the field to which the paper is related.

The data and information gained with the empirical research, as well as theoretical thoughts and comparative analyses in the Proceedings will give a significant contribution to the development of the use of ADL in a pedagogical way.

We wish to extend our gratitude to all authors and participants to the Conference, as well as to all those who contributed to, or supported the Conference, especially the Kingdom of Norway and the Jefferson Institute, as well as to the Ministry of Defense and the Armed Forces of the Republic of North Macedonia for their immense support of the Conference.

Skopje, November 2019

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History of Heutagogy as a self-determined learning

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Abstract. The essence of heutagogy is that in some learning situations, focus should be on what and how the learner wants to learn, not on what is to be taught. This approach is very different from more formal and traditional way of 'teaching' people. In heutagogy the educational process changes from being one in which the learned person (teacher, tutor, lecturer) pours information into the heads of learners to one in which the learner chooses what is to be learned and even how they might learn it. Heutagogy represents a change from teacher-centred learning to learner-centred learning.

Heutagogy is underpinned with assumptions of two key philosophies: humanism and constructivism. As mentioned above, the idea of the learner being central to the educational process is a humanistic concept. Originally, andragogy as a precursor to heutagogy, was identified with adult learning science, so many scientists firstly assumed that this would be updated case for heutagogy. However, as time goes by it becomes clear that heutagogy represents a science approach which should be available for learners of all ages.

The purpose of this paper is to review research on historical development of heutagogy as a science and self-determined learning and to make comparative analysis of heutagogy with andragogy and pedagogy. As time goes by a lot of scientists conclude that web-based learning, new information technologies and long distance learning and education methods lend themselves very well to a heutagogical approach.

1. Introduction

Heutagogy (pronounced **hyoo-tuh-goh-jee**) is a term derived from the Greek word "heuristic". According to Graham R. Parslow, "Heuristic is the Greek verb to discover, and underlies the etymology of the word "heuristic" that is defined as a method of teaching by allowing students to discover for themselves. Deriving from the same Greek root, the term heutagogy was coined in 2000 by Hase and Kenyon to describe self learning independent of formal teaching.

Since its beginnings in Australia in 2000, heutagogy has been presented as an extension of andragogy, but has received limited attention from higher education and from researchers.

Challenges of adopting a heutagogical approach are many, such as academic resistance to change and a "fear of relinquishing power" (from instructor to student), increased financial and learning pressure on students due to new technology requirements, and a continued student focus on assessment and grades rather than the learning process. The essence of heutagogy is that in some learning situations, focus should be on what and how the learner wants to learn, not on what is to be taught.

Hence this approach is very different from the more formal and traditional way of 'teaching' people. In heutagogy the educational process changes from being one in which the learned person (teacher, tutor, lecturer) pours information into the heads of learners, to one in which the learner

chooses what is to be learned and even how they might learn it. It represents a change from teacher-centered learning to learner-centered learning. In the heutagogical approach the 'learned' person takes on more of a role as a facilitator or guide as to how the desired learning might take place, and if formal assessment of self-determined learning. There are further elements to this approach to learning, such as the question of how the learning is going to take place, and how the learner is to be guided in their learning. Also, we need to be sure that the desired learning is within the capabilities and maturity level of the potential learner. One of the inherent benefits of the heutagogical approach that many learners have already discovered is that their learning capabilities are considerably enhanced through using this approach. Hence the challenge of learning something that, conventionally, might be perceived as being outside their capabilities, may in fact develop and extend learners' capabilities. This has particular relevance given today's emphasis on lifelong learning.

Heutagogy is underpinned with assumptions of two key philosophies: humanism and constructivism. As mentioned above, the idea of the learner being central to the educational process is a humanistic concept. Carl Rogers later adapted his client-centered approach to psychotherapy (1951) to education (1969) in what was termed student-centered learning. Similarly, constructivism places the learner at the heart of the educational experience [4]. Constructivism is based on the notion that people construct their own version of reality using past experience and knowledge, and their current experience. Thus, the learner is creative, actively involved in their learning and there is a dynamic rather than passive relationship between the teacher and the learner.

Heutagogical learning is not necessarily linear or planned, but much more informal and parallel with how people learn best outside of a school setting. The teacher serves more as a coach—a valuable resource to be tapped if necessary, but not the primary source of knowledge. Heutagogy is an interesting concept that can have a huge impact on our students.

Whereas pedagogy is teacher-led learning and andragogy is self-directed learning, heutagogy takes an approach that is different from both. In pedagogical environments, teachers determine what students will learn and how they will learn it. Students rely on their teacher and learn topics in the order in which they are presented. In contrast, students in andragogical environments use the teacher as a mentor or guide, but aim to find their own solutions to the tasks the teacher sets.

Meanwhile, the heutagogical approach encourages students to find their own problems and questions to answer. Instead of simply completing the tasks teachers assign, these students seek out areas of uncertainty and complexity in the subjects they study. Teachers help by providing context to students' learning and creating opportunities for them to explore subjects fully. As the image below illustrates, heutagogy requires the most student maturity and the least instructor control. Pedagogy, on the other hand, is on the opposite end of the spectrum.

Almost all adults are capable of taking control of their learning. Often, though, they carry expectations from previous experiences that get in the way. Self-directed learning does not always just happen. Sometimes it has to be crafted. Fortunately, participant expectations can be negotiated, goals can be clarified and a sense of community can be built within the classroom or change team. When that is done, the result is more likely to be a strongly learner-centered and learner-directed situation. Strong engagement and deep learning can then ensue. This chapter explains how it can be done, illustrating the approach with examples from university classes and action learning teams [5].

Open Context Model of Learning posits three phases of learning across the PAH (pedagogic-andragogic-heutagogic) Continuum: Pedagogic: when we learn using the focus of a subject discipline to structure that learning. Andragogic: when we learn how to negotiate what we want to learn both within and beyond a subject discipline, and how to collaborate with others in the social processes of learning. Heutagogic: when we begin to understand what the structure and form of our subject is and how we can start to play with form and transform it.

So the Open Context Model pre-supposes that we not only need to understand the structures of the subject under study, but also that we need to both identify processes of collaboration, as well as strategies for creative renewal.

Fortunately for this analysis George Martin, who signed The Beatles to his record label Parlophone in 1962, explicitly uses educational analogies in discussing their working together in 'All You Need is Ears' (2001). He observes that he was 'like a schoolteacher' in the early days (1962–4)

(pedagogy), and that after recording 'Yesterday' (June 1965) they became collaborators (andragogy), reflecting the first two stages of the PAH Continuum.

2. Heutagogy and E-learning

Heutagogy or self-determined learning, encourages students to become active participants in what they are learning. Rather than using a single-loop model of learning in which the learner identifies a problem, takes action, produces an outcome and then begins again with a new problem, doubleloop learning encourages students to reflect on their learning and to assess how it has changed their beliefs and actions and how they can apply what they have learned to other areas. Teachers become facilitators, not as leaders who sit back and let the students 'discover' their learning but as leaders who provide appropriate guidance, resources and models.

While heutagogy may be considered an outgrowth from andragogy, a term coined by Malcolm Knowles (1984) that suggests self-directed learning in adult education. In other words, teachers do not play a less significant role; they play a different role and it is one that is at the heart of good teaching. As more has been learned about education and learning, teachers, for the most part, have adapted their skills to suit the needs of students to help them learn in the best ways possible. Heutagogy enables growth for instructor and student alike. Originally, andragogy, the precursor to heutagogy, was identified with adult learning, and many assumed that to be the case for heutagogy. However, if one studies the skills and outcomes of heutagogy, it becomes apparent that heutagogy is an approach that should be available to learners of all ages [6].

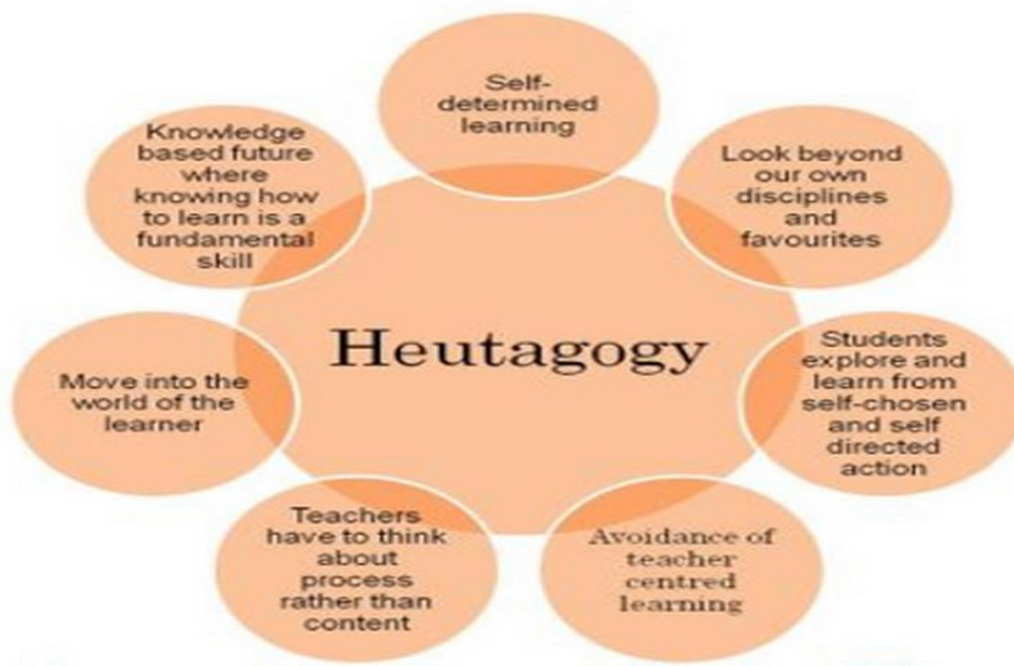


Figure 1: *Meaning of Heutagogy*

Hase and Kenyon (2000) claim that heutagogy, may be viewed as a natural progression from earlier educational methodologies – in particular from capability development – and may well provide the optimal approach to learning in the twenty-first century. Stephenson and Weil (1992) describe capable people as those who know how to learn; are creative; have a high degree of self-efficacy; can apply competencies in novel as well as familiar situations; and can work well with others. In a global world in which citizens must come together to solve global problems, surely we need to start at an early age to groom them to become effectively capable [7]. At the time that Stewart Hase and Chris Kenyon (2000) first introduced the concept of heutagogy, technology and education were not sufficiently well aligned to fully support a self-determined approach to learning. Just over a decade

later, it is a different story [8]. Enter the age of open education resources, social media, massive open online courses and digital badges – the start of an era where learners have substantially more control over what they learn, and how and where they learn it and a period in which the institutional grip on accreditation has begun to loosen. Today's term used by Kamenetz Self-Determined Learning (2010) to describe the new, self-directed and self-determined learners – want to learn on their own terms. A transformation of higher education is unfolding – 'a colossal shift, toward informal and nontraditional learning pursuits chosen by the learner where much of the content is "free and open" and new technologies are paving the way [9]. Heutagogy provides a theoretical framework for considering these systems in a holistic way, and the latest technologies serve as the agents for extending and supporting the framework. This chapter discusses emerging technologies that have triggered renewed interest in heutagogy and how these technologies support heutagogical practice.

An important concept in heutagogy is that of double-loop learning. In this style of learning, students not only think deeply about a problem and the actions they have taken to solve it, but also reflect upon the problem-solving process itself. The idea is that students will begin to question their assumptions and gain insight into not only what they are learning, but also how they learn [10]. With its emphasis on providing a learner-centered environment that supports students in defining their own learning path, heutagogy also equips students with skills that will help them transition into the workforce. Employers need employees to have a wide range of cognitive and meta-cognitive skills, like innovativeness, creativity, self-directedness, and an understanding of how they learn—all foundations of the heutagogical approach.

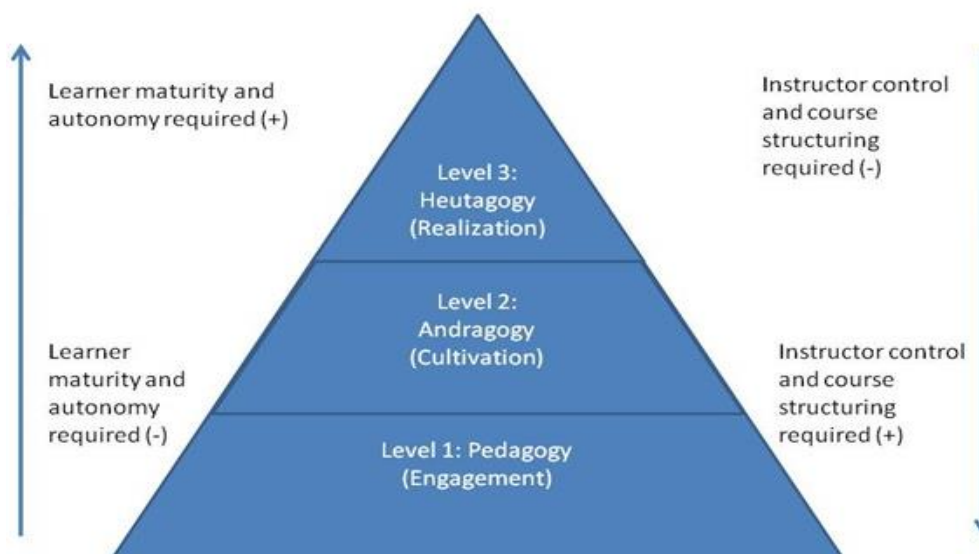


Figure 2: *Evolution from Pedagogy to Heutagogy*

Self-determined learning is at the core of heutagogy. The web is conducive to and reinforces self-determined learning, as learners access the internet to find information, and hyperspace lets learners choose the path that they will take in learning. Online education makes learning available anytime and anywhere, and open educational resources (OERs), such as the MIT Open Courseware project (<http://ocw.mit.edu/index.htm>), the Khan Academy (www.khanacademy.org) and Harvard's Open Learning Initiative (www.extension.harvard.edu/openlearning-initiative), further extend learning opportunities and make course content readily and abundantly available to learners – and to teachers. In addition, different media platforms (YouTube, video, chat rooms, online forums) provide learners with the flexibility to choose where, how and what they will learn [11].

Another important characteristic of heutagogy is double-loop learning, where learners confront their values and beliefs and adapt them accordingly, basing their decisions on the information available. In this process, learners 'try to find the most competent people for the decision to be made, and . . . try to build viable decision-making networks in which the major function of the group would

be to maximize the contributions of each, so that when a synthesis was developed, the widest possible exploration of views would have taken place [12].

Heutagogy is also characterized by group collaboration, a common attribute of Web 2.0. While Web 1.0 promoted the passive consumption of information and the creation of knowledge, Web 2.0 is characterized by user design and the development of new information. There is an emphasis on active learning rather than passive learning, with learners creating their own content, and as a result becoming more engaged in the learning process [13]. Tools are social and community-based, supporting the construction of individual and group knowledge [14]. For example, Google Docs can be used for classroom projects, allowing learners to work together in building new content and knowledge over time. LinkedIn groups and other social networks can support group collaboration and problem solving. In environments such as these, 'anyone can now learn anything from anyone at anytime' [15].

3. Conclusion

Our understanding for andragogy and heutagogy can be enhanced when they are considered in the wider context, concepts, field, habitus and capital [16]. Our contribution to knowledge is: to provide a pragmatic understanding of andragogy and heutagogy; to place the PAH Continuum in a wider context; and to associate and extend the theories of Pierre Bourdieu to the virtual world of learning. In broader terms, heutagogy can be seen as a key component in responding to Web 2.0 affordances and understanding new modes of learning in the changing public context of our transition from social hierarchies to social networks: as Ben Hammersley put it in the British Council Lecture of 2011, 'An Internet of People'. We need to design new approaches to learning and to create new contexts for learning that reflect an emerging networked digital society rather than a mechanical, industrial one. We commend heutagogic learning, and thinking, as the missing link in this process.

We can conclude that heutagogy is a specific scientific field of self-determinate learning with specific statement and advantages gained, listed as:

- Becoming more reflective and more ambitious;
- Providing different perspectives;
- Improving contributions to meetings;
- Implanting a real desire for a management post;
- Encouraging the individual to make applications for promoted posts.

With incorporating heutagogical practice, educators have the opportunity to better prepare students for the workplace and for becoming lifelong learners, as well as to foster student motivation by cultivating students who "are fully engaged in the topic they are studying because they are making choices that are most relevant or interesting for them.

Distance education has a particular affinity to the heutagogical approach, due to distance education's inherent characteristics of requiring and promoting learner autonomy, its traditional focus on adult learners, and its evolutionary and symbiotic relationship with technology – all characteristics shared with this emerging theory. Because of this affinity, distance education is in a unique position to provide a sustainable environment for studying and researching this teaching and learning method – and for assessing and evaluating the theory's appropriateness as a theory of distance education [17].

SIDE model is best practice using a heutagogical approach in online learning. SIDE is an acronym for Students, Instructors, Design, and Experiential learning and suggests a way to move from the informal to formal learning context where there is a requirement to do so.

This model could be implemented in every institution, including military educational institutions. Institutions, instructional designers, and educators can use the model to adopt a heutagogical approach to learning and perhaps increase retention rates in the online learning environment. The SIDE model describes the changing roles and dynamics of students, the reassessment of instructor control, the fundamental principles of heutagogical instructional design, and the experiential factors to consider in teaching and learning in this way.

- Things to consider as you read this chapter:
- Heutagogy occurs in both formal and informal learning contexts
- When learners achieve an autodidactic approach to their learning, heutagogy comes into use
- Learning, and the design of new technology, can both be seen as individualistic enterprises; online education needs to cater to such individualism
- The SIDE model represents a way to increase the value proposition of online education.

In near future heutagogy is more than a realistic option for every high educational, especially scientific institution, and also very realistic for military educational institutions.

For example, preparations and also the phase of operational construction of joint military exercises could be made with heutagogic approach of sharing knowledge and experience. Students create the learning approaches. Teachers are only responsible for the context and primary sources, or a couple of words for the research topic.

The education process does not have limits. So, the students' choice of education in a military educational environment must also be unlimited. Students must be aware of cyber and similar networks attacks because they sometimes use more or less important documents.

Whereas pedagogy is teacher-led learning and andragogy is self-directed learning, heutagogy takes an approach that is different from both. In pedagogical environments, teachers determine what students will learn and how they will learn it. Students rely on their teacher and learn topics in the order in which they are presented. In contrast, students in andragogical environments use the teacher as a mentor or guide, but aim to find their own solutions to the tasks the teacher sets.

Also, self-determined learning could be a subset of andragogy, because the adult learners have experience, but a few of them know how to properly use technology and to learn from it.

Heutagogy in near future can work as a synchronous distance learning environment, but depends on web tools and applications for synchronous distance learning, for example: scientific quizzes or environment or online platform which is online present for every participant for sharing knowledge and scientific results.

Evaluation and effectiveness of knowledge evaluation could be done with online exams, quizzes, study exams and so on.

In heutagogy the fascinator is a student, because teachers only give the topic; the researcher of the topic is a student independent in their research.

Students can succeed in a heutagogic approach only with evaluation by the teacher. The evaluation process could be done by: an exam, topic essay, scientific paper and so on online.

Students in heutagogy as self-determined learners are mature when they prove their knowledge in front of the teacher with online: course, exam, research paper, scientific paper and so on. The best reliable scientific resources for heutagogic approach for learning are reliable resources such as: online courses for a given topic, Google, web pages, e-library (NATO multimedia library, SCOPUS, Emerald, Thomson Reuters and so on).

At the final stage of this paper we can conclude this: Pedagogy - the art and science of teaching, especially to children; Andragogy - the art and science of teaching adult learners; Heutagogy - self-determined learning and Technoheutagogy which is another approach involving the study of technology to enhance the experience of learner-directed learners. Bill Pelz (2012) explains, very succinctly in a YouTube video clip, the differences between the terms pedagogy, andragogy, heutagogy and technoheutagogy which is technology-enhanced learner-directed learning environment.

References:

- [1] Bruner, J. (1960), *The Process of Education*. Cambridge, MA: Harvard University Press. Caine, G., Nummela-Caine, R. and Crowell, S. (1999), *Mindshifts: A Brain-based Process for Restructuring Schools and Renewing Education* (2nd edn). Tucson, AZ: Zephyr Press.
- [2] Stewart Hase and Chris Kenyon. Self-determined learning. Heutagogy in action.UK, USA,2013, 39-42.
- [3] An Internet of People. British Council. Retrieved 31 May 2012 from: <http://blog.britishcouncil.org/2011/03/annual-lecture2011/>

- [4] Hase, S. & Kenyon, C. (2007). Heutagogy: A child of complexity theory. *Complicity: An International Journal of Complexity and Education*, 4(1), 111-119.
- [5] Thornton Moore, D. (2004). Curriculum at work: An educational perspective on the workplace as a learning environment. *Journal of workplace learning*, 16(6), 325-340.
- [6] Bonk, C. J. (2009), *The World is Open: How Web Technology Is Revolutionizing Education*. San Francisco.
- [7] Duffy, P. and Bruns, A. (2006), 'The use of blogs, wikis and RSS in education: a conversation of possibilities', *Proceedings Online Learning and Teaching Conference*, 31–8, Brisbane. <http://eprints.qut.edu.au>
- [8] Canning, N. & Callan, S. (2010). Heutagogy: Spirals of reflection to empower learners in higher education. *Reflective Practice*, 11(1), 71-82.
- [9] Argyris, C. (1976), 'Single-loop and double-loop models in research on decision making', *Administrative Science Quarterly*, 21, 363–75
- [10] Blaschke, L. M. and Brindley, J. (2011), 'Establishing a foundation for reflective practice: a case study of learning journal use', *European Journal of Open, Distance, and E-Learning (EUODL)*, Special Issue. Retrieved 29 November 2012 from: www.eurodl.org/materials/special/2011/Blaschke_Brindley.pdf.
- [11] Duffy, P. and Bruns, A. (2006), 'The use of blogs, wikis and RSS in education: a conversation of possibilities', *Proceedings Online Learning and Teaching Conference*, 31–8, Brisbane. <http://eprints.qut.edu.au>
- [12] Bonk, C. J. (2009), *The World is Open: How Web Technology Is Revolutionizing Education*. San Francisco.
- [13] Grenfell, M. (2008), *Pierre Bourdieu: Key Concepts*. Stocksfield, England: Acumen.
- [14] Hammersley, B. (2011), *Annual Lecture 2011; An Internet of People*. British Council. Retrieved 31 May 2012 from: <http://blog.britishcouncil.org/2011/03/annual-lecture2011/>
- [15] Hase, S. & Kenyon, C. (2007). Heutagogy: A child of complexity theory. *Complicity: An International Journal of Complexity and Education*, 4(1), 111-119.
- [16] Lisa Marie Blaschke (2012). Heutagogy and Lifelong Learning: A Review of Heutagogical Practice and Self-Determined Learning Oldenburg University and University of Maryland University College (UMUC), 4-7.
- [17] Anderson, T. (2010). Theories for learning with emerging technologies. In G. Veletsianos (Ed.), *Emerging technologies in distance education*. Edmonton: Athabasca University Press. Retrieved from http://www.aupress.ca/books/120177/ebook/02_Veletsianos_2010_Emerging_Technologies_in_Distance_Education.pdf
- [18] Grenfell, M. (2008), *Pierre Bourdieu: Key Concepts*. Stocksfield, England: Acumen.
- [19] Hammersley, B. (2011), *Annual Lecture 2011*.

Publisher: Military academy “Mihailo Apostolski”, Skopje, www.ma.edu.mk

Editors: Dr Sc Jugoslav ACHKOSKI, Associate professor,
Dr Sc Biljana KAROVSKA – ANDONOVSKA, Associate professor

Proofread: Elena TRAJANOVSKA

Content edited by: Kristijan ILIEVSKI

Cover page design: Aner BEHLIC

Copies: 100

Printed by: Art Print Studio

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CIP - Каталогизација во публикација
Национална и универзитетска библиотека "Св. Климент Охридски", Скопје

355.45(062)

INTERNATIONAL Scientific Conference MILCON'19 (2019 ; Skopje) (2)
Proceedings of papers / 2-nd International Scientific Conference
MILCON'19, Skopje. - Skopje : Military academy "Gen. Mihailo
Apostolski", 2019. - 243 стр. : илустр. ; 24 см

Фусноти кон текстот. - Библиографија кон трудовите

ISBN 978-9989-134-10-4

a) Национална безбедност - Собири
COBISS.MK-ID 111434250